

NOTES AND DESCRIPTIONS OF NEW CALIFORNIA
BOMBYLIIDAE

(Diptera)

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The deserts and mountains of California are particularly rich in Bombyliidae, especially the former areas. As far as can be ascertained there have been no comprehensive works dealing with the bee fly fauna from this arid region. Priddy (1939) published a list of the species collected in southern California, but his list represents approximately only 10 to 15 per cent of the actual numbers present. It is the hope of the author that he may, in some way, contribute to the knowledge of the bee fly fauna through articles such as this. A much more comprehensive work is planned for the future, dealing mainly with the bombyliids of California.

The following notes and descriptions are presented at this time in order to facilitate the return of borrowed material and to make the names available for use elsewhere. All of the species described herein are from California, the types are all located in the collection of the California Academy of Sciences, San Francisco, California.

The following three closely related genera belong to the subfamily Cylleniinae, as set forth by Bezzi, 1924. They may be recognized by the prominent bilobed occiput, second longitudinal vein originating at an acute angle, with four posterior cells, anal cell open, tibiae without bristles (a few feeble ones occasionally present), and a more or less bare elongated abdomen. The following key will serve to separate the three genera:

1. With three submarginal cells, ocellar tubercle located near vertex *Amphicosmus* Coquillett
With only two submarginal cells.....2
2. Ocellar tubercle situated near middle of front; third antennal segment rather broad, tapering to a point which may or may not be narrowly truncate *Metacosmus* Coquillett
Ocellar tubercle situated near the vertex; third antennal segment with apex distinctly truncate..... *Paracosmus* Osten Sacken

Genus AMPHICOSMUS Coquillett

In 1923 Cole described the female of an unique species which he named *Amphicosmus vanduzeei*; it was collected at Palm Springs, California. No mention of the species has been made since that time, nor had the author seen any specimens other than the

type. It is a rather small inconspicuous fly and a rather slow flyer, which could very easily account for its not being readily seen and collected. There are two other species within the genus, one *elegans* Coquillett described from California, the other *cincturus* Williston described from Mexico. I give below a key to separate the known species of this small genus.

Key to species of *Amphicosmus* Coquillett

1. Legs partly black; first antennal segment black.....2
 Legs entirely yellowish; first antennal segment of female yellow, of male black; posterior margins of abdominal segments yellowish
 *vanduzeei* Cole
2. Femora with base and apex yellowish; basal portion of abdomen reddish*elegans* Coquillett
 Femora entirely black, abdomen black, except for posterior margins of segments*cincturus* Williston

Cole's type female of *A. vanduzeei* is known from only one specimen. I have before me seven specimens from the desert region of California. I hereby designate the following specimen, the description of which is given below, as the allotype male, Borego, San Diego County, California, April 28, 1955 (P. H. Timberlake).

Allotype male: Eyes separated by width of ocellus, which is situated slightly anterior to vertex, a slightly elevated weal runs from ocellus to vertex; front black, silver pollinose, white pilose; face black, shining between and in front of antennae, lower portion of face whitish-yellow, except near eye margin, an elongate spot of same color below each antenna, silver pollinose and white pilose on sides below antennae; antennae black, white pilose above and below, segments one and two equal in length, third segment broad, elongate, longer than basal two together, tip truncate, arista wanting; eyes with smaller facets on lower half, but without a division line; proboscis black, with short white hair below and on labellae; palpi black with white hair, about one-third as long as proboscis; occiput black, silver pollinose.

Thorax and scutellum shining black, with short white hair tomentum wanting; anterior half of thorax with two silver pollinose stripes which extend half way back on dorsum, another similar spot on upper anterior side of pleura which extends from anterior callus to root of wings, both pollinose areas confluent anteriorly, thorax and scutellum without bristles; pleura shining black, bare except for a silver pollinose spot overlaid with white pile in front of halteres. Coxae black with white hair, legs entirely orangish, except last three tarsal segments and a small spot at apex on anterior surface of femora, black, entire legs with white hair, longer on femora, bristles wanting; pulvilli large, pad-like nearly as long as claws; halteres with stems and knobs white; squamae rather small, white, with white fringe. *Wings* hyaline, costa, subcosta and first vein yellow to junction with second vein; other veins yellow basally, brown apically; small cross-

vein slightly beyond middle of discal cell. *Abdomen* shining black, posterior margins of all segments yellowish-white, decreasing in extent posteriorly, short white pilose, longer on segment one, tomentum wanting; venter like dorsum, only first three segments visible, tergites of segments four to seven completely cover their counterparts on venter; pygidium moderately large, ninth tergite orange, pygidial segments with small white hairs.

The male differs from the female only slightly; in the latter the front and face are not as extensively silver pollinose; the dorsum of the thorax is not vittate, and the humeral callosus are yellowish.

Material examined was collected at Borego, San Diego County, California April 27, 1955, April 28, 1955 (R. Schuster, M. Wasbauer, P. H. Timberlake); Near Parker Dam, three miles N. Crossroads, San Bernardino County, California, April 22, 1951 (G. F. and C. D. MacNeill).

PARACOSMUS Osten Sacken

The genus *Paracosmus* was originally described by Loew as *Allocotus*. *Allocotus* was preoccupied so Osten Sacken in *Western Diptera* (p. 262) changed the name to *Paracosmus*. Melander (1950) gives a short discussion of *Paracosmus* in which he mentions the striking similarity and intergradation between *edwardsii* and *morrisoni*, the two commonest representatives of the genus. The new species described below appears to be very closely related to these two species, but is easily separated on the basis of the shape of the third antennal segment, color of face and by the smaller size and shape of the genitalia. It will run to couplet three in Melander's key.

Paracosmus similis Hall, new species

Male: Eyes narrowly separated; front entirely silver pollinose, white pilose; ocelli shining black, black pilose; face silver pollinose on upper half, lower half shining black, a few white hairs on underside below eyes, otherwise bare; proboscis not projecting, black; palpi brownish with long white hairs; antennae black, first two segments subequal with short black hair, third segment equal to basal two together, broadest beyond middle, apex distinctly truncate; occiput dull black below, upper half sparsely silver pollinose.

Thorax, dorsum shining black, two silver pollinose stripes run length of notum, confluent in front with lateral stripes running posteriorly over root of wings, all four stripes meet posteriorly in a large pollinose spot, pollinose areas covered with short, fine, white hair, longer and more snow-white in front and on sides; pleura shining black, bare except a few white hairs in front and below halteres, a silver pollinose stripe runs obliquely backward from base of fore coxae to end above halteres, another stripe runs upward from hind coxae to end behind halteres; coxae and trochanters black, tip of

all coxae silver pollinose, bare except for a few short, fine hairs; legs orange, base of front femora dark, extreme apex of all femora and tibiae on dorsal surface black, tarsi black, first segment lighter; pulvilli large, slightly shorter than claws; squamae white with white fringe; halteres with stem and base of knob brownish, apex of knob white; scutellum dull black, covered with short, fine whitish hair. *Wings* hyaline, veins pale-brown, r-m crossvein beyond middle of discal cell, petiole of third vein equal to apical portion, anal cell narrowed apically. *Abdomen* dull black, hind margins of all segments white, margins on segments six and seven very narrow, abdomen bare except for a tuft of white hair on sides of first segment; segments two to five sparsely silver pollinose when viewed from in front, more obvious on segments four and five; venter black, with short, fine, black hair on posterior margins of all segments, confined to middle of margin on segment one; genitalia large, entirely black, segments with black hair, paraprocts coming together over top, hiding dististyli and aedeagus.

Female: Very much like the male, with the usual sexual differences in addition to the front not pollinose except next to eyes, frontal pile black; dorsal thoracic vittae narrow and incomplete; hind margins of abdominal segments very narrowly white, wanting on segment seven.

Holotype male and allotype female taken at WESTGARD PASS, INYO COUNTY, CALIFORNIA, July 10, 1953 (E. G. Linsley). Two male paratypes with the same data, one in author's collection, the other in the collection of the University of California at Berkeley.

Paracosmus insolens Coquillett was described from the male only. I have before me twelve specimens of which six males agree with the description of *insolens*; the other six, which are females, differ only slightly from the males. On the basis of this, coupled with the fact that they were collected together, leaves me little doubt of the association of the sexes. I herewith give a redescription of the male, together with the description of the female, which I designate as the allotype.

PARACOSMUS INSOLENS Coquillett

Male: Eyes separated slightly more than width of ocelli; ocellar tubercle located at vertex, a single ocellus located one-fourth the way down front; front black, densely silver pollinose, short white pile on lower half, bare up to ocelli; face conically projecting, silver pollinose on upper half only, short, fine, white hairs along oral margin, lower half of face bare, shining brownish; antennae black, basal segments subequal, third longer than basal two together, broadest before or at middle, tapering to pointed apex, a few white hairs on underside of segment two only; proboscis black, not projecting; palpi lighter with a few long white hairs; occiput black, silver pollinose on sides and partly below, upper part to vertex shining black, white pilose.

Thorax shining black, short, sparse white pile on disc, longer and more abundant on anterior edge and sides in front of wing base; front part of thorax with two silver pollinose spots extending backwards to root of wings,

posterior end of spot deeply bifurcate giving impression of two stripes; another silver pollinose spot in front of scutellum extends onto base of scutellum; pleura black, bare except for patch of white hair on propleura and in front of halteres, a silver pollinose stripe runs from propleura backwards above coxae to beyond halteres; legs black, knees yellowish, short white pilose; hind tarsi somewhat brownish; pulvilli large, pad-like; squamae yellowish with white fringe; halteres with stems and knobs white; scutellum shining black, a few minute hairs on sides at base. *Wings* hyaline, veins yellowish-brown, r-m crossvein slightly beyond middle of discal cell, petiole of third vein slightly longer than apical portion, anal cell narrowed apically. *Abdomen* black, entire posterior margin of segment one broadly yellowish, segment two with yellowish color forming triangle on posterior margin, smaller on segment three, segments four to six with posterior margins only narrowly yellowish, long white pile on side of first segment, rest of abdomen white pubescent, all segments silver pollinose, extending nearly to lateral margins; venter bare, shining black, basistyli bulbous, shining black, eighth tergite drawn out, on lower portion, into a long slender projection extending backward and hiding dististyli.

Allotype female: Differs very slightly from the male. It may be recognized by the following diagnostic characters: Front shining black, silver pollinose above and at sides of antennae only; face silver pollinose on sides of upper half, bare and shining black in middle; anterior edge of thorax shining black prealar callosus silver pollinose; front tibiae yellowish on undersurface; r-m crossvein beyond middle of discal cell; petiole of third vein slightly shorter than apical portion; abdomen shining black without silver pollen; hind margins of all segments bright yellow, short pubescence yellowish, genitalia covered by dense whitish hair. Otherwise like the male.

Allotype female from Borego, San Diego County, California, April 27, 1955 (M. Wasbauer). Material examined was all collected at Borego on the following dates: April 1, 1953, April 2, 1953, April 24, 1955, April 27, 1955 by P. D. Hurd, M. Wasbauer, and R. Schuster.

Genus LORDOTUS Loew

The genus *Lordotus* has long been a favorite with the author. In 1954 he published a revision of the group. Since that time only a single new species has been found. This new species was collected on the Colorado Desert, a favorite locality of the genus. Many species are to be found in the desert regions and it is not unlikely that there are several more new forms yet to be discovered. It is with a great deal of pleasure that I name this species in honor of Dr. P. D. Hurd who has done much to aid the author in his study of the Bombyliidae.

Lordotus hurdi Hall, new species

Male: Entirely black, tibiae and first tarsal segment light, face grayish to light brownish pilose, lower part of face and under eyes with white hair,

omentum wanting; antennal segment one nearly three times as long as segment two, with black hair above and brownish hair below; segment two nearly as broad as long, with black hair above and below; segment three much longer than basal two together, evenly tapering from base to apex; occiput white pilose and tomentose; dorsum of thorax and scutellum with erect whitish pile, tomentum wanting; pleura brownish white pilose, metapleura bare, tomentum wanting; coxae yellowish-white pilose; femora whitish pilose and tomentose, middle femora with a series of black hairs in middle on anterior surface; tibiae whitish tomentose, bristles black, a long yellowish spur at apex of middle tibia; tarsi with fine whitish scales above, bare below; squamae white with white fringe; halteres, stems yellow, knobs white; basicosta whitish pilose, costa without denticulations; wings hyaline, basal half of veins yellow, apical half brown; abdomen uniformly white pilose, destitute of tomentum; venter entirely white pilose; tomentum wanting, last sternite enclosing genitalia, yellowish.

Female: Front white pilose and tomentose; face white pilose; dorsum of thorax when denuded shows three faint grayish vittae, white tomentum, overlying the vittae, when viewed from above, forms three vague stripes, tomentum longer and more dense on posterior end, pile and tomentum generally whiter than in male, anterior surface of middle femora with only a few short black hairs; abdomen white tomentose, denser on posterior margins of segments two to four and on a median dorsal line, extending from segments one to four, segment five densely covered with white tomentum. Otherwise identical to male.

Holotype male and allotype female, BOREGO, SAN DIEGO COUNTY, CALIFORNIA, April 1, 1953 (P. D. Hurd). Paratypes: 4 females, 3 males topotypic, 2 females, 1 male in author's collection, 2 females, 1 male in collection of U.C. at Berkeley, 1 male Mojave, Kern County, California, April 24, 1949 (C. D. MacNeill).

L. hurdi runs to couplet 13 in the key to the males and to *albidus* in the key to the females in my previous paper on this genus. In the males *hurdi* can be easily separated from *junceus* by the yellowish tibiae and lack of tomentum on the abdomen. The female of *hurdi* can be separated from the female of *albidus* by the wholly black femora and the black pile on the upper side of the antennae.

In making determinations of various beefly collections, the *Aphoebantus* group has given the author a good deal of trouble. Their easily rubbed pile and tomentum and the lack of non-variable characters among the more closely related species have made their determination difficult at times. The author has been aided in a large part by the availability of the large, well classified collection of Dr. A. L. Melander. Melander's paper on *Aphoebantus* while excellent in many respects still leaves much to be desired. A good

number of species have been based on single specimens, not only by Melander but earlier workers as well, this has led to confusion mainly when attempting to associate the sexes. Quite often the opposite sex of one species looks more closely related to another than it does to its mate. In order to more fully understand the relationships within the genus, much larger series of each species, preferably from various localities, need to be studied. The amount and extent of variation of several characters used for separation has never been adequately established, partially because of the lack of sufficient material for study.

Of the new form described below it gives me great pleasure to name it in honor of Mr. E. I. Schlinger, who, through his tireless efforts, has been of considerable aid to the author in many ways.

Aphoebantus schlingeri Hall, new species

Female: Front black with brownish-yellow pile and tomentum, the latter very dense; face grayish pollinose beneath a dense covering of pale yellow pile and white tomentum; palpi black with pale yellow hairs; antennae black, first segment more than twice as long as second, third with bulbous base, not strongly constricted, nearly as long as apical styliform portion, basal segments with brownish-yellow hairs above, pale yellow ones below; occiput black, dense white scales on lower portion extending upward to slightly beyond eye emargination, scales on upper portion and vertex yellow.

Thorax subshining black, densely covered with brownish scales, with short hair of same color, a narrow white tomentose stripe extends from anterior humeri over root of wings to posterior humeri, bristles pale (not black); scutellum subshining black, evenly and densely covered with brownish tomentum, a patch of white scales on side at base, bristles pale; pleura black, white tomentose, pile wanting except on propleura and upper part of mesopleura which is white; coxae black, white pilose and tomentose, a few yellow hairs at apex of middle coxae; femora black, apex and all of tibiae and tarsi pale yellowish-brown, bristles of the same color, hind femora with a few short bristles apically and moderately long hairs basally on ventral surface; halteres stems yellow, knobs white; wings hyaline, first posterior cell slightly narrowed, no stump of a vein at angle R_{3+4} , angle at base of third posterior cell with a small stump extending into discal cell; basicosta with white scales and black setulae. *Abdomen* black, without black scales, entirely covered with brownish tomentum, hind margins of segments one to six with a band of whitish scales, wide on segment one and decreasing in extent posteriorly, short pale yellow pile over-all, lateral tuft of white pile at side of segment one; venter black, white pilose and tomentose.

Male: Differs very little from the female, it may be recognized by the silvery pollinose front and face with fine pale yellow pile; occiput entirely pale white tomentose except for a few yellow scales at vertex; anterior

portion of thorax with long white scales; hind femora with long hairs but no bristles on ventral surface, some hairs are bristle-like; abdomen with abundant, erect, white pile, lateral margins of all segments white tomentose; genitalia not large, with white pile and tomentum; no stump of a vein at base of third posterior cell; otherwise like the female.

Holotype female, DAVIS, YOLO COUNTY, CALIFORNIA, Sept. 4, 1955 (E. I. Schlinger); allotype male, Davis, California, Sept. 3, 1955 (A. D. Telford). Seventeen paratypes in the University of California at Davis collection, and in the collection of the author. They were collected at various dates at Davis.

In one specimen the frontal and facial pile and tomentum is white, in other specimens the whitish incisures of the abdomen are represented by a concentration of fuscous scales on the posterior margin. The bristles on the hind femora in the female may be represented by one to six bristles. The abdominal tomentum varies from a dirty white to a fuscous color.

The male of *A. schlingeri* runs to couplet 53 in Melander's key. It may be separated from *marcidus* Coq. and *micropyga* Mel. by the difference in color of pile and tomentum, the rather narrow apex of the first posterior cell and in the shape and color of the pygidium. The female on the other hand runs to couplet 56 where it doesn't exactly fit either choice; the female can be made to key out to *hians* Mel. by stretching a point or two, but a comparison cannot be made as the female of *hians* is unknown.

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